

WHAT IS CLAIMED IS:

1. A press machine, comprising:

drive means for operating a slide in a cycle;

a press center on said slide;

5 a first and a second guide member on said press machine;

a line between said first and said second guide members passing through
said press center; and

10 said slide receiving a driving force from said drive means, and alignment
said first and said second guide members with said press center eliminating
rotational forces upon said slide and guiding said slide in said cycle along a
common centerline, thereby increasing press machine precision, operational life,
and rigidity.

2. A press machine, according to claim 1, further comprising:

a frame supporting said drive means and said slide;

15 said frame having a continuous shape symmetrical about said press center;

a crank shaft and a main gear in said drive means;

said main gear having a position eccentric about said crank shaft;

a first link extending perpendicular from said crank shaft; and

20 a second link rotatably couples said first link to said main gear and
increases and transmits said drive force from said main gear to said crank shaft
whereby said slide operates in said cycle.

3. A press machine, according to claim 2, further comprising:

a top and a bottom dead center position on said slide;

said main gear having a rotation angle (θ);

said crank shaft having a rotation angle (θ'');
an inner angle (θ') defined between said first and said second link;
said inner angle (θ') at a maximum when said slide is at said bottom dead center;

5 said inner angle (θ') at a minimum when said slide is at said top dead center; and

 said rotation angle (θ) being distributed between said inner angle (θ') and said rotation angle (θ'') and said drive means distributes a slide speed during said cycle and slows said slide in the vicinity of said bottom dead center position while speeding said slide in a quick return and increases a pressing force at said bottom dead center position.

10 4. A press machine, according to claim 3, further comprising:
 at least a first and a second side member of said slide;
 said first and second side members operable between each respective said
15 first and second guide members;

 at least a first and a second slide side gib;
 each said first and second slide side gib on each respective said first and said second side member of said slide;

20 at least a first, a second, and a third mating surface on each respective said first and said second slide side gibs;

 at least a front, a side, and a rear liner on each respective said first and second guide members; and

 each said front, side, and rear liners in guiding contact with each respective said first, second, and third mating surfaces whereby said slide operates vertically

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along said common centerline and said press center and prevents said rotational force.

5. A press machine, comprising:

a frame;

5 a flywheel;

a drive mechanism;

a slide in said frame;

said slide operating along a first centerline of said frame;

a press center on said slide;

10 said press center aligned with said first centerline and said frame;

said drive mechanism operating said slide along said press center;

said slide and said frame symmetrical about said press center and said first centerline; and

said frame being continuous and symmetrical about said first centerline

15 whereby said frame resists a rotational force during a pressing operation and eliminates an operational gapping risk.

6. A press machine, according to claim 5, further comprising:

a first and a second side member in said frame;

said first and second side members opposite a second centerline of said

20 frame;

a crown member in said frame joining said first and second side members;

a drive mechanism holding section in said frame;

said crown member and a drive mechanism holding section supporting said drive mechanism;

25 a bed member; and

said bed member connecting said first and second side members below said slide whereby said first and said second side member rigidly joined and said frame is increased in strength and rigidity thereby minimizing an operational gapping and increasing a pressing precision.

- 5 7. A press machine, according to claim 6, further comprising:
at least a first and a second guide members in said frame;
each said first and second guide members disposed symmetrical about said press center and said first centerline;
each said first and said second members supporting said slide;
10 at least a first liner member in each said first and second members;
at least a first and a second slide side gib in said slide;
each said first and second slide side gib in guiding contact with each said first liner on each respective said first and second members; and
said first and second members and each said first liner engaging said slide
15 and allowing said slide to operate in said press machine, whereby operational gapping is prevented and said pressing precision is improved.

- 20 8. A press machine, according to claim 7, further comprising:
a drive shaft in said drive mechanism;
said slide having a top and a bottom dead center position;
said drive shaft rotatably disposed on said frame;
a gear section on said drive shaft operable joined to said flywheel;
a main gear rotatably disposed on said frame;
said main gear meshing with said gear section;
a crank shaft rotatably disposed on said frame;
25 an eccentric section on said crank shaft;

a connecting rod operably coupling said crank shaft to said slide;

a first link fixed to a first end of said crank shaft;

said first link perpendicular to said crank shaft;

a second link operably connecting said first link to said main gear;

5 a first angle operably defined between said first and second link whereby
said first angle is at a maximum at said bottom dead center position and at a
minimum at said top dead center position; and

10 a rotation axis of said main gear and a rotation axis of said crank shaft are
eccentric along a common center line, whereby a speed of said slide is at a
minimum at said bottom dead center and a maximum at said top dead center
position thereby increasing a pressing force at said bottom dead center position.